

CLASSIFICATION ~~CONFIDENTIAL~~ **CONFIDENTIAL**
 CENTRAL INTELLIGENCE AGENCY
 INFORMATION FROM
 FOREIGN DOCUMENTS OR RADIO BROADCASTS CD NO.

50X1-HUM

COUNTRY USSR
 SUBJECT Scientific - Isotopes
 HOW PUBLISHED Monthly periodical
 WHERE PUBLISHED USSR
 DATE PUBLISHED Nov 1949
 LANGUAGE Russian

DATE OF INFORMATION 1949
 DATE DIST. 10 Mar 1950
 NO. OF PAGES 2
 SUPPLEMENT TO REPORT NO.

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF ESPIONAGE ACT 50 U.S.C. 3165 AND 3166. ITS TRANSMISSION OR THE REVELATION OF ITS CONTENTS IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW. REPRODUCTION OF THIS FORM IS PROHIBITED.

THIS IS UNEVALUATED INFORMATION

SOURCE Priroda, No 11, 1949.

THE INCREASED CONTENT OF HELIUM
IN CERTAIN MINERALS

O. Ye. Zvyagintsev

In the course of several decades attention has been drawn to the unusual high content of helium in beryllium minerals. V. G. Khlopin and Sh. A. Abidov observed in 1943 the increased content of helium also in a number of lithium and boron minerals.

An unequivocal explanation of this phenomenon was not given. The hypothesis of O. Khan concerning the production of helium from atoms of beryllium decomposing under the influence of gamma rays turned out to be incorrect. Still unanswered was the question: Was helium entrapped in these minerals by occlusion during crystallization or was helium formed by the radioactive decay of other elements entrapped during crystallization?

This question was successfully answered by Academician V. G. Khlopin by comparing the isotopic composition of helium released from beryls and spodumene with the isotopic composition of helium from natural gas and from radioactive minerals.

Helium from radioactive sources contains almost no isotope of atomic weight 3 or, more accurately, its content in radioactive helium is given by the following ratio:

$$\text{He}^3/\text{He}^4 < 2 \cdot 10^{-10}$$

This was shown by the scientific labors of the Radium Institute of the Academy of Sciences USSR and by later efforts of L. T. Aldrich and A. O. Nier.

- 1 -

CLASSIFICATION		CONFIDENTIAL		CONFIDENTIAL	
STATE	<input checked="" type="checkbox"/> NAVY	<input checked="" type="checkbox"/> NSRB	DISTRIBUTION		
ARMY	<input checked="" type="checkbox"/> AIR	<input checked="" type="checkbox"/> FBI	all		

CONFIDENTIAL

CONFIDENTIAL

50X1-HUM

Helium released from beryls and spodumene turned out to contain helium-3 in the same proportion as that for helium from natural gas. The ratio of helium-3 to helium-4 in this case lies within the following limits:

$$\text{He}^3/\text{He}^4 = 0.5 - 12 \cdot 10^{-7}.$$

Such an isotopic composition of helium released from beryls and spodumene excludes the possibility of its formation as a result of radioactive decay or other nuclear reactions. V. G. Khlopin proposed only one possible explanation, namely: the selective occlusion, by these minerals when dissolved in magma, of helium during their crystallization. This explanation, correct for beryls and spodumene, will probably be true also for boron minerals, on which corresponding determinations have not yet been carried out. (See V. G. Khlopin's article in Doklady Akademii Nauk SSSR, Vol LXVI, No 5, 1949).

- E N D -

- 2 -

CONFIDENTIAL

CONFIDENTIAL